

CLAIMS.

1. A process for producing polypropylene having increased melt strength by irradiating polypropylene in pellet form with an electron beam having an energy of from 0.5 to 25 MeV, delivered by an accelerator having a power of from 50 to 1000 kW and with a radiation dose of from 10 to 120 kGray, characterised in that the irradiation is carried out in the presence of air.
2. The process according to claim 1 wherein the electron beam has an energy of from 5 to 10 MeV.
3. The process according to claim 1 or claim 2 wherein the accelerator has a power of from 120 to 600 kW.
4. The process according to any one of the preceding claims wherein the total radiation dose is of from 40 to 100 kGray.
5. A method for producing polypropylene with improved melt strength, comprising the steps of:
 - a) extruding the polypropylene fluff under nitrogen and with little or no antioxidant additives to produce polypropylene pellets or semi-finished products;
 - b) optionally, packaging the pellets under air in conventional industrial bags;
 - c) placing the bags or the unbagged pellets arranged in uniform layer, under air on a continuously moving conveyor that passes under the electron beam;

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- d) irradiating the polypropylene under air with the electron beam of step c) said electron beam having an energy of from 0.5 to 25 MeV and with a dose of from 10 to 120 kGy;
 - e) optionally thermally treating the irradiated pellets at temperatures below the melting point in order to kill the free radicals before polymer re-extrusion;
 - f) re-extruding the polypropylene with antioxidant additives and, optionally with non-irradiated material, under nitrogen, said antioxidant being added to the extruder either simultaneously with the polypropylene or later along the length of the extruder;
 - g) granulating and packaging under air.
6. The method according to claim 5, wherein the electron beam has an energy of from 5 to 10 MeV.
7. The method according to claim 5 or claim 6 wherein the total dose of irradiation is of from 40 to 100 kGray.
8. The method according to any one of claims 5 to 7 wherein the irradiation dose can be delivered in several passes under the electron beam.
9. The method according to any one of claims 5 to 8 wherein during irradiation the polypropylene is conveyed past the electron beam at a speed of from 0.5 to 20 m/min.
10. The method according to any one of claims 5 to 9 wherein no antioxidant additives are added prior to ionisation.
11. The method according to any one of claims 5 to 10 wherein the time elapsed between the irradiation and the second extrusion is of from a few minutes to several weeks, at a temperature of the order of 25 °C.